25
28
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32
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36
40
100 mm
1.0
2.8
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3.2
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1.25
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ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
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2.0 mm
A5
PG

Research Report
Office of Educational Assessment
Research and Development Section
Jane Canner, Administrator
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Citywide Results of the New York City 1985 Science Survey Grades 5 and 8

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New York Citywide Science Survey 1985

Grades 5 and 8

ABSTRACT

In order to assess the level of science education in the pre-high-school grades in New York City, citywide science surveys were developed and administered for the second year in May, 1985 at grades 5 and 8. These instruments were designed to provide school, district, and citywide information about student achievement in the basic science curriculum which includes biology, earth science, physics, chemistry, and process skills. The purpose for collecting such data was to facilitate the planning of staff development in order to focus on areas of greatest need.

A comparison of the citywide student performance on the 1984 and 1985 science surveys indicates a significant improvement in science achievement citywide at both grades 5 and 8 as measured by the average percent of items correct. Fifth-grade general education students answered 64 percent of the 60 items correctly in 1985, as compared to 56 percent of 42 items in 1984. Similarly, eighth graders answered 58 percent of 60 items correctly in 1985, an improvement over their 1984 performance of 52 percent of 41 items. These levels indicate that fifth graders almost met the anticipated criterion of 65 percent; eighth graders were somewhat below this criterion. The area students performed most poorly in was chemistry.

DISUSSION OF PROCESS AND RESULTS

RATIONALE

The citywide science survey was developed and administered to provide information on science achievement that would be useful for identifying areas of instructional need so that resources could be allocated efficiently to staff development programs. The New York City survey was designed to identify school, district and citywide strengths and deficiencies in the areas of science which form the basis for the elementary and junior high school course of study: biology, earth science, physics, chemistry, and process skills. The identification of strengths and deficiencies provides a basis for the development of a plan to address areas that may need instructional assistance.

The identification of instructional needs together with appropriate staff development programs should not only be conducive to improved student acquisition of science learning and skills but also should lead to improved articulation of science curriculum and instruction throughout grades K-12. It is expected that such improved articulation in turn, will ultimately lead to better preparation of students for the more rigorous science programs offered in the high schools.

TEST DEVELOPMENT

The Board of Education believes that testing and learning are integral parts of the same curriculum and instructional effort. Tests must validly reflect curriculum in order that student achievement of that curriculum be

adequately measured and areas of strength and deficiency identified. Such identification is necessary to target instructional needs so that appropriate action can be taken. Because no published test adequately reflected objectives in the New York City and New York State science curricula, a customized test was developed in-house. Grades 5 and 8 were chosen as the target grades because they were considered to be crucial points in the sequence of science instruction. It is particularly important to identify possible problem areas in science instruction at these grades because problem areas not remediated at these points carry over into the next school administrative organizational level: intermediate or junior high and high school. This can seriously interfere with the instructional program at the succeeding level.

The test was designed to provide only group data in order to pinpoint schools or districts that may have instructional or staff development needs in their science programs. Although 1985 individual student scores were reported to schools and districts, there was no intention that such scores be reported to the individual students.

Because it was not possible to measure all the science objectives with one test, an advisory committee consisting of representatives from the community school districts was asked to identify and select appropriate important objectives for inclusion in the test at each grade. Items were then written to measure each objective. All items were reviewed for readability and vocabulary level, lack of ambiguity, elimination of possible bias, and to ensure that the item measured the objective and had one and only one correct answer.

At each grade a pool of reviewed items was assembled. Selected items from the 1984 surveys were added to the pool at each grade in order to make possible a comparison of 1984 and 1985 results. In order to eliminate a separate pilot test administration of new items, it was decided to include in the final test administration more items than were needed for final test results. This procedure would permit elimination of the poorer items prior to scoring the final test. Sixty items were included in the 1985 surveys compared with the 42 items of 1984 in order to improve the reliability of subtest and total test scores.

At each grade 80 items were administered, scored, and analyzed. Then, 60 of the 80 items were selected for final scoring based upon item content and statistical characteristics. The items were selected to measure objectives from each of the five areas of science included in the curriculum: biology, earth science, physics, chemistry, and process skills. The number of items selected for a final subtest varied in proportion to the emphasis placed on each area in the Minimum Teaching Essentials. Statistical characteristics for item selection were item difficulty and discrimination. Based upon the selected test content the panel of field practitioners hypothesized a mastery criterion of 65 percent of the total of 60 items correct or 39 items.

TEST ADMINISTRATION

On May 21, 1985 the New York Citywide Science Survey -- Grade 5 was administered to 58,263 grade 5 students in more than 600 schools citywide. The New York Citywide Science Survey -- Grade 8 was administered to 56,595 grade 8 students in more than 150 schools citywide. At grade 5, these

numbers included 4,921 Special Education and 1,537 limited-English-proficient students and at grade 8 included 4,774 Special Education and 649 limited-English-proficient students. The English version was translated into Spanish and Chinese for administration to those students who preferred to take the survey in the alternative language. The Spanish version was administered to 569 students in grade 5 and to 904 students in grade 8. The Chinese version was administered to only ten students in grade 5 and to only two students in grade 8.

FINDINGS

The results of the 1985 science survey administration are reported in Tables 1 through 5. Tables 1 through 4 report overall citywide results for grades 5 and 8, while Tables 5A and 5B report results by district. Table 1A and 1B present comparisons of 1985 with 1984 data whereas Tables 2 through 5 present data for 1985 only.

Overall science achievement in grade 5 increased to 63.5 percent correct of the total of 60 items in 1985 from 55.6 percent correct of the total of 42 items in 1984 and in grade 8 increased to 58.2 percent correct of the total of 60 items in 1985 from 51.8 percent correct of the total of 41 items in 1984. (See Table 1A). These gains are statistically significant at the .01 level.*

At each grade these observed differences (i.e., gains) in total score between 1984 and 1985 were verified by the Rasch anchor-item equating procedure. This Rasch analysis was based upon the set of anchor items

* The Division of Curriculum and Instruction attributes these gains in part to their year-long science staff development program, funded by the City Council.

linking the 1984 and 1985 tests at each grade. The gains in science achievement are due to improved student performance in science and not to a change in the test items or to the number of items included.

The total test raw scores for each grade were normally distributed as shown in Tables 4A and 4B. There was no piling up of low scores or high scores which indicates that the surveys were appropriate measures of science achievement for the grade 5 and 8 students. In both grades, although the percent of items correct improved from 1984 to 1985, the mastery criterion (65 percent of the items correct) hypothesized by practitioners in the field, was not met, although it was close to being met in grade 5. The criterion of 65 percent of the items correct was met in 14 districts* in grade 5 and 4 districts* in grade 8. (See Tables 5A and 5B).

It is of interest to look at the subtest data. In grade 5, except for chemistry where the average percent of items correct was 53, the citywide performance on the other four subtests ranged from 62 to 68 percent of the items correct. In grade 8, except for biology where the average percent of items correct was 65, the citywide performance on the other four subtests ranged from 53 to 58 percent of the items correct. However, citywide at both grades student performance was poorest in chemistry as measured by the percent of items correct, 52.8 percent in grade 5 and 52.6 percent in grade 8. This poor performance in chemistry relative to the other subtest areas is also true of every district in both grades (see Tables 5A and B). Student performance in chemistry suggests a need for improved instruction

* This excludes District 33 which is not a typical district and where 65 percent of the items correct was achieved by 82.4 percent of the students in grade 5 and 62.2 percent in grade 8.

in this area or perhaps for some revision in the chemistry objectives included in the curriculum.

Boys performed somewhat better on the surveys than did girls. In grade 5 boys got 65 percent of the items correct while girls got 62 percent correct, while in grade 8 the percent of items correct was 60 for boys and 56 for girls. These New York City sex differences of 3 and 4 percentage points in grades 5 and 8, respectively, are less than the sex differences of 6 percentage points in grades 5 and 9 as reported on the 1983 Second International Science Study.*

RELIABILITY AND VALIDITY

The reliability and validity of the New York City Science Survey were ascertained in several ways. The 1985 test was a reliable measure of science achievement at each grade, as indicated by reliability coefficients** for the total test of .90 at grade 5 and .89 at grade 8. These figures indicate that the tests were homogeneous, and that results from the test are consistent. The reliability of the subtests were lower, but still acceptable, due primarily to the small number of items ranging from a low of .53 for the 9-item grade 5 biology subtest to a high of .74 for the 18-item grade 5 physics subtest.

These reliability estimates compare favorably with those of the 1984 surveys where total test reliability was .84 for grade 5 and .80 for grade 8. Subtest reliabilities in 1984 ranged from a low of .27 for the 5-item

* The Newsletter of Teachers College/Columbia Unversity. Spring 1985 Volume 13 Number 2. Office of Public Relations. Teachers College/ Columbia University. New York, N.Y. 10027

**The Kuder-Richardson Formula 20 was used to measure test reliability.

process skills subtest in grade 5 to a high of .62 for the 14-item physics subtest in grade 5. The higher 1985 reliabilities were most likely due to the inclusion of more and better items.

Content validity, how well the content of the test is matched to curriculum content, is crucial to a measure of achievement such as the science survey. This was ensured by the test development procedures at each grade. Objectives relevant to the science curriculum were identified and items constructed to measure these objectives. Completed items were edited to ensure appropriate measurement of each objective and 80 items were selected for administration. Analysis of the item data from the 80-item test was conducted and the 60 most appropriate items were selected for the final form. Item selection was based upon content mix that reflected the curriculum and desirable psychometric characteristics of the items. At each grade a second item analysis based on the selected 60-item final survey was performed. The results revealed that the item difficulty and discrimination data were appropriate and at desirable levels.

CONCLUSIONS

The 1985 science survey yielded useful information concerning the current level of science achievement in grades 5 and 8. First and most important is that the results show that science achievement has improved over that of 1984. However, in 1985 the 64 percent correct of the 60 items at grade 5 and the 58 percent correct at grade 8 were somewhat below the anticipated 65 percent correct, although in grade 5 it was very close. These data indicate that students have not yet mastered the science curriculum in grades 5 and 8 at the hoped for levels of achievement. This

finding is in line with a National Science Foundation* report which reported that nationally not only was little instructional time devoted to science but that such science instruction as there was, was poor at best. These findings all highlight the need for staff development and training.

The survey was designed to pinpoint areas of school and district strength and deficiency among the areas that constitute the basis of the science curriculum: biology, earth science, physics, chemistry, and process skills. At both grades 5 and 8, the results citywide and by district indicates that performance was poorest in chemistry. Because the objectives to be measured and the items measuring these objectives had been judged to be of appropriate difficulty for the students to be tested, the relatively poor performance in chemistry must result from lack of student knowledge in this area. The results of the 1985 Science Survey at grades 5 and 8 should be used to plan instructional and staff development activities for the 1986-87 school year. For example, the findings with respect to chemistry, in particular, have indicated an area that requires special attention.

* Science and Engineering for the 80s and Beyond. NSF 80-78, National Science Foundation, October, 1981. Washington, D.C.

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Citywide Results of the New York City 1985 Science Survey Grades 5 and 8

TABLE 1A
New York Citywide Science Surveys: 1985 and 1984
Citywide Results by Subtest and Total: Grades 5 and 8
General Education

Grade 5

Test	1985 (N = 53,342) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20	1984 (N = 52,328) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20
Biology	9	5.86	1.92	65.1	.53	5	2.53	1.31	50.7	.38
Earth Sc.	15	9.75	2.98	65.0	.69	12	6.54	2.46	54.5	.61
Physics	18	12.18	3.55	67.7	.74	14	8.03	2.61	57.3	.62
Chemistry	9	4.75	2.29	52.8	.66	6	3.59	1.57	60.0	.54
Pr. Skills	9	5.54	2.33	61.6	.71	5	2.66	1.17	53.3	.27
Total	60	38.08	10.71	63.5	.90	42	23.35	6.94	55.6	.84
% of students reaching criterion score of 39 (65 percent of 60 items correct)				49.8		% of students reaching criterion score of 27 (65 percent of 42 items correct)				33.2

Grade 8

Test	1985 (N = 51,821) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20	1984 (N = 54,149) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20
Biology	12	7.83	2.53	65.2	.66	6*	3.93	1.46	65.5	.52
Earth Sc.	12	6.90	2.39	57.5	.55	9	4.55	1.99	50.6	.52
Physics	13	7.60	2.97	58.5	.72	9	4.69	2.00	52.1	.53
Chemistry	13	6.83	2.80	52.6	.65	10	4.58	1.93	45.8	.43
Pr. Skills	10	5.74	2.40	57.4	.68	7	3.49	1.54	49.8	.42
Total	60	34.91	10.54	58.2	.89	41*	21.24	6.53	51.8	.80
% of students reaching criterion score of 39 (65 percent of 66 items correct)				38.3		% of students reaching criterion score of 27 (65 percent of 41 items correct)				21.8

* Of the original seven Biology items, one was not scored.

TABLE 1B
New York Citywide Science Surveys 1985
Citywide Results by Subtest and Total: Grades 5 and 8
Special Education

Grade 5

Test	1985 (N = 4,921) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20	1984 (N = 4,844) No. of Items	Raw Score Mean	Raw Score S.D.	% Total Items Correct	KR20
Biology	9	4.14	1.98	46.0	.49	5	1.93	1.22	38.5	.27
Earth Sci.	15	6.19	2.84	41.2	.61	12	4.13	2.11	34.5	.46
Physics	18	7.72	3.82	42.9	.74	14	5.52	2.59	39.4	.58
Chemistry	9	2.87	1.77	31.9	.43	6	2.19	1.45	36.6	.43
Pr. Skills	9	3.30	2.08	36.6	.60	5	1.90	1.20	37.9	.25
Total	60	24.22	9.57	40.4	.86	42	15.67	5.90	37.3	.75

% of students reaching criterion raw score of 39 (65 percent of 60 items correct) 9.1

% of students reaching criterion raw score of 27 (65 percent of 42 items correct) 5.0

Grade 8

	1985 (N = 4,774)					1984 (N = 4,243)				
Biology	12	5.21	2.40	43.4	.57	6*	2.28	1.47	38.1	.45
Earth Sc.	12	4.53	2.19	37.8	.47	9	3.10	1.62	34.5	.28
Physics	13	4.17	2.44	32.1	.58	9	2.77	1.57	30.8	.28
Chemistry	13	3.88	2.09	29.8	.42	10	3.07	1.57	30.8	.16
Pr. Skills	10	3.01	1.89	30.1	.48	7	2.13	1.38	30.4	.30
Total	60	20.80	7.85	34.7	.80	41*	13.36	4.71	32.6	.62

% of students reaching criterion raw score of 39 (65 percent of 60 items correct) 3.6

% of students reaching criterion raw score of 27 (65 percent of 41 items correct) 1.3

* Of the original seven Biology items, one was not scored.

TABLE 2
New York City Science Survey 1985
Summary of Students Tested Citywide
Grades 5 and 8

	Grade 5			Grade 8		
	General Education	Special Education	Total	General Education	Special Education	Total
Answer Sheet Received						
Tested*	53,342	4,921	58,263	51,821	4,774	56,595
Absent	3,229	623	3,852	6,159	1,302	7,461
Exempt LEP	929	14	943	439	8	447
Exempt SE	1	211	212	0	110	110
Excused	12	1	13	4	4	8
No Score (no reason)	247	71	318	926	162	1,088
TOTAL	57,760	5,841	63,601	59,349	6,360	65,709
Language Group						
English Version						
English Profic.	51,106			50,149		
Lim. Eng. Prof.	1,592			646		
TOTAL	52,698			50,795		
Spanish Version	590			895		
Chinese Version	10			2		
Miscodes	44			129		
TOTAL	53,342			51,821		
Sex						
Males	26,230			25,500		
Females	26,863			26,065		
Miscodes	249			256		
TOTAL	53,342			51,821		

* Basis for school, district, citywide reports.

TABLE 3A
New York Citywide Science Survey 1985
Citywide Results by Item, Subtest, Total Test
Difficulty (p-value) and Discrimmation ($r_{pt\ bis}$)

Grade 5 General Education N=53,342

	Item Number*	p-Value	$r_{pt\ bis}$
Biology (9 items)	2	74	.35
	4	64	.24
	5	71	.29
	6	46	.25
	7	51	.27
	8	71	.26
	10	73	.25
	11	67	.43
	12	69	.31
Mean		65	
Earth Science (15 items)	13	61	.42
	14	69	.32
	16	67	.35
	17	85	.36
	19	45	.29
	20	72	.39
	21	75	.36
	22	92	.27
	24	59	.27
	26	62	.34
	27	49	.38
	29	41	.34
	31	67	.31
	32	75	.40
	33	56	.22
Mean		65	
Physics (18 items)	34	83	34
	35	72	35
	36	65	40
	37	66	36
	38	78	32
	40	51	26
	42	64	26
	44	51	38
	45	66	35
	46	77	43
	47	67	33
	48	51	31
	49	69	36
	50	83	36
	51	77	35
	52	63	24
	54	68	40
	56	67	34
Mean		68	

	Item Number*	p-Value	$r_{pt\ bis}$
Chemistry (9 items)	58	65	.45
	59	40	.32
	60	39	.31
	62	63	.34
	63	55	.42
	64	58	.43
	65	50	.37
	67	48	.40
	68	58	.37
Mean		53	
Process Skills (9 items)	69	57	.45
	70	72	.37
	71	86	.39
	72	70	.40
	73	51	.42
	75	62	.45
	76	59	.29
	78	53	.44
	80	44	.36
Mean		62	
Total (60 items)			
Mean		64	

*Item number refers to the number of the item in the test booklet.

TABLE 38
New York Citywide Science Survey 1985
Citywide Results by Item, Subtest, Total Test
Difficulty (p-value) and Discrimination ($r_{pt\ bis}$)

Grade 8 General Education N=51,821

	Item Number*	p-Value	$r_{pt\ bis}$		Item Number*	p-Value	$r_{pt\ bis}$
Biology	1	62	.38	Chemistry	51	65	.19
(12 items)	2	55	.26	(13 items)	52	57	.44
	3	75	.38		53	64	.41
	4	88	.28		56	56	.50
	7	63	.37		57	46	.26
	8	78	.28		58	51	.31
	10	73	.19		59	67	.39
	11	65	.34		60	60	.28
	12	80	.30		61	58	.34
	13	55	.32		63	50	.35
	14	46	.44		64	35	.25
	15	43	.34		65	41	.21
					68	35	.22
Mean		65		Mean		53	
Earth	17	49	.33	Process	69	57	.36
Science	19	55	.44	Skills	70	88	.37
(12 items)	20	72	.32	(10 items)	71	39	.37
	21	72	.14		72	52	.41
	22	40	.18		73	46	.38
	23	63	.32		74	52	.27
	25	66	.27		75	69	.44
	26	48	.24		76	72	.37
	27	43	.16		78	42	.30
	28	58	.30		80	58	.40
	30	64	.29				
	31	61	.25	Mean		57	
Mean		58		Total (60 items)			
				Mean		58	
Physics	32	79	.42				
(13 items)	34	41	.31				
	35	57	.32				
	36	71	.41				
	37	46	.46				
	39	49	.24				
	41	44	.30				
	42	54	.43				
	44	69	.43				
	45	61	.38				
	46	62	.31				
	47	61	.39				
	49	66	.40				
Mean		58					

* Item number refers to the number of the item in the test booklet.

TABLE 3D
New York City Science Survey 1985
Item Difficulties by Sex
Grade 8
(N = 51,565)

	Item Number**	Male	Female		Item Number**	Male	Female
Biology	1	67*	57*	Chemistry	51	65	64
(12 items)	2	57	53	(13 items)	52	59	56
	3	77	72		53	62	64
	4	87	88		56	59	53
	7	64	62		57	47	46
	8	82	73		58	53	49
	10	71	74		59	64	70
	11	69	61		60	58	61
	12	82	77		61	58	58
	13	60*	49*		63	49	50
	14	50	43		64	34	35
	15	46	40		65	44	38
					68	38	32
Mean		68	62				
				Mean		53	52
Earth Science				Process	69	55	57
(12 items)	17	52	45	Skills	70	86	90
	19	61*	48*	(10 items)	71	43	36
	20	74	70		72	55	49
	21	73	71		73	45	46
	22	38	41		74	51	52
	23	66	61		75	69	68
	25	65	67		76	70	72
	26	49	47		78	41	42
	27	49*	36*		80	60	57
	28	58	58				
	30	66	61	Mean		58	57
	31	63	59				
				Total			
Mean		60	55	(60 items)			
				Mean		60	56
Physics	32	81	76				
(13 items)	34	46*	36*				
	35	61	53				
	36	73	69				
	37	53*	39*				
	39	51	48				
	41	50*	37*				
	42	60*	48*				
	44	71	67				
	45	62	59				
	46	65	58				
	47	62	60				
	49	71*	61*				
Mean		62	55				

* Difference of 10 or more points in p-value (grade 8 - 9 items).

** Item number refers to the number of the item in the test booklet.

TABLE 3C
New York City Science Survey 1985
Item Difficulties by Sex
Grade 5
(N = 53,093)

	Item Number**	Male	Female
Biology (9 items)	2	77	72
	4	67	62
	5	70	72
	6	48	46
	7	54	48
	8	71	70
	10	74	73
	11	69	65
	12	71	68
Mean		67	64
Earth Science (15 items)	13	68*	55*
	14	71	67
	16	69	65
	17	87	84
	19	49	42
	20	78*	67*
	21	78	73
	22	92	92
	24	58	60
	26	62	62
	27	53	45
	29	46	37
	31	67	68
	32	76	76
	33	58	55
Mean		67	63
Physics (18 items)	34	83	83
	35	73	71
	36	66	64
	37	70	63
	38	80	76
	40	56	47
	42	67	62
	44	56*	46*
	45	66	66
	46	80	74
	47	72	63
	48	58*	43*
	49	71	69
	50	85	82
	51	80	75
	52	64	63
	54	72	65
	56	67	66
Mean		70	65
Chemistry (9 items)	58	67	64
	59	42	39
	60	40	37
	62	63	64
	63	58	51
	64	58	58
	65	56*	46*
	67	50	47
	68	59	57
Mean		55	51
Process Skills (9 items)	69	54	61
	70	70	75
	71	84	88
	72	67	74
	73	50	53
	75	59	65
	76	57	62
	78	53	53
	80	44	45
Mean		60	64
Total (60 items)			
Mean		65	62

* Difference of 10 or more points in p-value (grade 5 - 5 items)

** Item number refers to the number of the item in the test booklet.

TABLE 5A
New York Citywide Science Survey 1985
Mean P-Value* by District
Grade 5

	Subtests					Total Test				
	General Education					Gen. Ed.		Gen. Ed. & Spec. Ed.		N (Gen. Ed.)
	Bio.	E. Sc.	Phys.	Chem.	Pr. Sk.	1985	1984	1985	1984	1985
No. of Items	9	15	18	9	9	60	42	60	42	
District										
1	60	57	61	44	54	56	48	54	46	765
2	72	69	73	57	69	69	58	67	57	1,553
3	65	61	64	48	57	60	53	57	51	930
4	59	60	61	46	52	57	49	55	48	1,011
5	59	56	60	43	52	55	47	53	46	912
6	60	61	63	44	53	58	51	57	50	1,732
7	56	56	60	42	53	55	46	52	44	1,082
8	60	63	65	50	58	61	53	59	51	1,672
9	58	58	60	42	51	55	48	53	47	2,174
10	62	62	65	49	56	60	52	59	51	2,737
11	66	70	70	55	63	66	59	64	57	1,806
12	59	57	61	42	52	55	49	53	47	1,292
13	62	62	67	50	60	61	62	60	60	1,476
14	67	67	68	53	61	64	59	63	57	1,475
15	63	63	65	50	61	61	51	60	50	1,810
16	62	61	64	50	58	60	52	58	50	931
17	62	61	65	48	57	60	55	58	54	2,382
18	66	67	69	55	64	65	58	64	56	1,442
19	64	60	66	46	58	60	51	58	50	2,107
20	70	73	73	64	67	70	62	69	61	1,842
21	65	69	71	56	67	67	59	64	57	1,591
22	72	70	73	59	69	69	59	67	58	2,184
23	57	55	59	41	51	54	45	52	44	922
24	65	68	69	55	65	66	56	64	55	2,349
25	72	73	75	63	73	72	63	70	62	1,691
26	78	79	79	69	79	77	69	74	67	1,010
27	67	66	70	55	65	66	57	63	55	2,417
28	68	67	71	57	66	67	57	65	55	1,704
29	70	69	71	59	65	68	61	66	59	2,007
30	66	69	72	57	65	67	60	65	58	1,985
31	75	72	74	63	74	72	61	71	60	2,898
32	59	57	60	46	53	56	52	54	52	1,292
33	77	76	80	71	79	77	66	76	66	91
Total	65	65	68	53	62	64	56	62	54	53,342
Total N						53,342	52,328	58,263	57,044	53,342

* Mean p-value is the percent of items answered correctly.

TABLE 5B
New York Citywide Science Survey 1985
Mean P-Value* by District
Grade 8

	Subtests					Total Test				
	General Education					Gen. Ed.		Gen. Ed. & Spec. Ed.		N (Gen. Ed.)
	Bio.	E. Sc.	Phys.	Chem.	Pr. Sk.	1985	1984	1985	1984	1985
No. of Items	12	12	13	13	10	60	41	60	41	
District										
1	62	51	50	45	50	51	47	50	46	753
2	69	62	64	59	66	64	58	62	56	1,457
3	58	51	49	45	50	51	45	49	43	828
4	62	55	58	53	57	57	49	55	48	1,007
5	59	55	52	48	50	53	48	51	47	1,012
6	59	51	51	45	49	51	45	51	45	1,336
7	60	52	50	45	49	51	45	49	43	1,085
8	63	56	56	47	52	55	48	53	46	1,913
9	60	53	50	46	49	51	47	49	46	1,843
10	61	55	55	50	53	55	47	54	47	2,204
11	69	58	60	56	60	61	56	59	54	2,070
12	57	52	50	46	48	51	47	46	42	861
13	60	54	54	50	54	54	50	52	49	1,415
14	63	57	54	51	54	56	49	54	48	1,314
15	62	54	55	48	54	54	46	52	44	1,244
16	58	54	51	45	49	51	46	48	45	630
17	62	54	54	51	51	55	47	54	46	2,145
18	67	58	57	52	55	58	50	57	49	1,576
19	63	53	53	47	52	54	45	52	44	1,874
20	70	60	61	57	61	62	55	61	54	2,336
21	61	56	59	54	60	58	54	56	54	2,017
22	69	63	67	60	68	65	59	63	57	1,783
23	56	50	49	44	47	49	43	47	41	988
24	67	61	60	54	62	61	55	60	55	2,101
25	75	69	70	62	70	69	62	67	60	1,901
26	76	65	72	64	74	70	62	66	60	1,164
27	66	60	60	51	59	59	53	58	52	2,647
28	69	62	63	56	61	62	53	61	52	1,484
29	67	57	60	55	56	59	51	58	51	2,147
30	66	55	58	53	58	58	53	56	52	1,748
31	75	65	70	59	68	67	59	66	58	3,304
32	63	55	55	52	53	56	52	53	50	1,280
33	75	67	68	60	70	68	59	65	56	333
Total	65	58	58	53	57	58	52	56	50	51,821
Total N						51,821	54,149	56,595	58,249	51,821

* Mean p-value is the percent of items answered correctly.